

Claims

1. A packaging structure for a semiconductor device, comprising:
 - a substrate surface-mountable on a mounting surface of a circuit board, wherein the substrate has a first side facing away from the mounting surface and a second side being on the same side of the structure as the mounting surface;
 - a recess in the second side of the substrate;
 - a semiconductor die having a first side and a second side, and mounted in said recess, with the first side of the semiconductor die facing away from the mounting surface and a portion of the first side of the semiconductor die bonded to said substrate within the recess.
2. A structure according to claim 1, wherein said recess includes an exposed portion of the substrate facing the mounting surface and said portion of the first side of the die is bonded to said exposed portion.
3. A structure according to claim 2, wherein the bond between the die and the substrate is an electrical connection.
4. A structure according to claim 1, wherein said substrate has a hollow portion extending from the first side of the substrate to the recess.
5. A structure according to claim 1, wherein:
 - said substrate comprises first and second substrate layers, the first substrate layer having first and second opposing sides and the second substrate layer having first and second opposing sides;
 - the first side of the first substrate layer is the first side of the substrate and the second side of the second substrate layer is the second side of the substrate; and
 - the second side of the first substrate layer is mounted to the first side of the second substrate layer.

6. A structure according to claim 5, wherein the second substrate layer has inner walls defining a hollow portion extending from the first side of the second substrate layer to the second side of the second substrate layer, with the inner walls defining at least part of said recess.
7. A structure according to claim 6, wherein:
 - the first substrate layer has a hollow portion extending from the first side of the first substrate layer to the second side of the first substrate layer;
 - the hollow portion through the first substrate layer is smaller than the hollow portion through the second substrate layer, such that where the second side of the first substrate layer is mounted to the first side of the second substrate layer, a portion of the second side of the first substrate layer is exposed, not being covered by the first side of the second substrate layer; and
 - the exposed portion of first substrate layer defines at least part of the recess.
8. A structure according to claim 6, wherein the hollow portion defined by the hollow portion is rectangular.
9. A structure according to claim 1, further comprising electrical connections running from where the die is bonded to said recess to the mounting surface.
10. A structure according to claim 9, further comprising bond pads connecting said die to said electrical connections.
11. A structure according to claim 1, wherein said die has edges and further comprising sealant sealing between the edges of said die and said substrate.
12. A structure according to claim 11, wherein said sealant comprises a highly viscous material.

13. A structure according to claim 1, further comprising a thermally conductive and electrically insulating encapsulant in said recess, on the second side of the semiconductor die.
14. A structure according to claim 13, wherein said encapsulant comprises a viscous, thermally conductive material.
15. A structure according to claim 14, wherein the encapsulant is flush with the level of the second side of the substrate.
16. A structure according to claim 1, wherein said die is a sensor chip.
17. A structure according to claim 1, further comprising a non-opaque portion mounted to the substrate on the same side of the structure as the first side of the substrate.
18. A structure according to claim 17, wherein said non-opaque portion is a transparent cover on the first side of said substrate.